AN ALTERNATIVE TO QUALITATIVE ANALYSIS.

Introduction to Experimental Inorganic Chemistry. By H. Biltz. Translated by William T. Hall and J. W. Phelan. Pp. vi+185. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1909.)

THIS book is intended to supply the lack of knowledge of descriptive chemistry which has resulted from the omission of "test-tube work" from the curricula of the schools or its restriction to small classes of advanced scholars. As compared with the "qualitative analysis" which it is intended to precede or to replace, as the case may be, the course now suggested has certain obvious advantages, arising more especially from the fact that the experiments are designed directly for the purpose of supplying a knowledge of the elements and their compounds, instead of serving this purpose only indirectly through the medium of a scheme of work designed originally for an entirely different purpose.

The abuse of the older method, by which a student could be trained to "get out" his salts and pass his examinations without acquiring any adequate knowledge of the processes used in doing this, is well known, but the alternative scheme now suggested is by no means free from faults. One of the most serious accusations that may be levelled against it arises from its monotony. Thus, in dealing with the metals, the student is expected to examine one metal after another, to heat it, dissolve it in acids, and then try the effect of a series of different agents on its solutions. After this has been done for a dozen different metals the student would certainly complain of weariness, and it is doubtful whether his mental faculties would be kept sufficiently on the alert to produce any permanent impression at the end of his course. The loss of the interest which is supplied in qualitative analysis by the incessant stimulus of a problem to be solved is a very serious drawback, and the course which the authors present would need very careful handling to prevent the class from going to sleep over its work or gliding through it without effort and, therefore, without profit.

The best use to which the book could be put would be as a duplicate text-book for a student engaged on qualitative analysis, so that when presented with a new element he might, whilst learning how to detect it, acquire at the same time some systematic experimental knowledge of its properties. If blended in this way with a series of problems, the experiments now described would undoubtedly be of considerable value.

The most noticeable fault in the arrangement of the book is due to an uncertainty on the part of the authors as to whether they are giving instructions for, or supplying a descriptive account of, the experiments. This confusion has resulted in a compromise whereby one experiment is described in the imperative tense and the next as a narrative in the present tense. It is also a characteristic weakness of the scheme that formulæ and equations are given without any hint as to the quantitative experiments on which they must necessarily be based. This lack might doubtless be corrected by a teacher who was aware of the danger that the class might look upon a formula or an equation as an inspired product, to be accepted as a revelation sent down to mankind through the prophetic agency of the writers of text-books; but a course of chemistry which leads off with the words, "Hydrochloric acid, HCl, is a colourless gas. . . ." would (if left to develop its natural effects) be admirably calculated to propagate this all too prevalent heresy.

T. M. L.

THE WELFARE OF WOMEN.

The Health of the Nations. Compiled from Special Reports of the National Councils of Women. Pp. 191. (London: Constable and Co., Ltd., 1910.) Price 1*s.* net.

THE International Council of Women, of which the Countess of Aberdeen is president, was formed in 1888 by "a company of earnest American women" (p. 7). The result of their efforts was a federation of national councils, or unions, or associations, of women working for the common welfare. Mrs. Ogilvie Gordon sketches in this small volume the history of the council, noting the resolutions of its quinquennial meetings in the various countries, and summarising, for the year 1909, certain "special reports" prepared by representative women in Europe, America, and other continents. The movement is ambitious, and it is almost needless to say that the "special reports" here collated are of the most generalised kind. In a brief 200 pages of well-leaded print, it is not possible to give a passable summary of the "health" even of one nation, not to speak of the twenty-one "nations," or countries, here dealt with. But it is gratifying to find some twenty-two national councils of women (p. 12) sufficiently interested in general hygiene to produce even these somewhat sketchy "reports."

The main point is that the nations are thus showing an increasing concern for one another, and the International Council of Women, in focussing attention on the leading features of public-health progress, is doing, *pro tanto,* a real international service. Such reports are intended to excite interest rather than to provide materials for scientific conclusions, and, from this point of view, there is much to be said for them.

It is, however, to be regretted that there is so little reference in detail to extant official or other trustworthy documents. Had the papers each been supplemented by a short list of definite references, the usefulness of the little volume would have been immeasurably increased. As it is, one has difficulty in taking the statements on trust. For instance, in a "report on public health" for the "countries" of "Great Britain and Ireland," one finds it said—and the date of the "preface" is 1909—that "there is no compulsory notification of tuberculosis in Great Britain, but voluntary notification, instituted by local authorities, obtains in many places" (p. 65). Yet at that date, May, 1909, nearly 25 per cent. of the population of Scotland was under "compulsory notification," a fact that could have been obtained without difficulty, either from published blue-books or from

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application to the Local Government Board for Scotland. Incidentally, it may be said that the percentage now probably approaches 50; yet a volume on "The Health of the Nations," issued in 1910, contains no clue even to the fact that Scotland is a separate administrative area of Great Britain.

This kind of report is not reassuring as to the other countries; but doubtless the various correspondents will be able to put inquirers "on the track" of more definite information. The work of collation is well done by Mrs. Ogilvie Gordon, and the volume forms a good intellectual point of repair for the many women everywhere concerned to consider and improve the life and labour conditions of women.

PROGRESS OF CHEMICAL AND PHYSICAL SCIENCE.

Fortschritte der Chemie, Physik, und physikalischen Chemie. Neue Folge des Physikalisch-chemischen Centralblattes. Vol. I., 1909. Edited by Dr. Hermann Grossmann and others. Pp. 386. (Leipzig: Gebrüder Borntraeger; London: Williams and Norgate, 1909.) Price 16 marks.

THIS work on the progress of chemistry, physics, and physical chemistry, which represents the first annual volume of a new series of the "Physikalisch-chemische Centralblatt," is issued in monthly parts, and contains a number of interesting reports by specialists on various branches of chemistry and physics, the period under review being 1908 and a portion of 1909.

Two articles on radio-activity and electronics indicate the interest attached to these rapidly developing branches of science, and it is gratifying to find that a substantial part of the pioneering work in this section results from the labours of British chemists and physicists.

The important subjects of spectroscopy, catalysis, thermochemistry, chemical equilibrium, velocity of reaction, and the theory of gases are dealt with in special reports. Recent observations on the influence of light on chemical change are summarised in the article "Photochemistry," by A. Byk.

The study of colloids is a branch of general chemistry now making rapid advances, and the researches of 1908 in this field are discussed by A. Müller, who also deals with the practical application of these investigations to the technical process of dyeing, tanning, photography, and biological chemistry.

The editor, Dr. H. Grossmann, contributes a memoir on complex chemical compounds, in which he reviews the work done in this branch of chemistry during the first half of the year 1909. He groups these so-called "molecular compounds" under four headings:—(1) Compounds with complex cations; (2) compounds with complex anions; (3) auto-complex compounds; and (4) organic-inorganic complex compounds.

One of the most interesting articles in this volume is that on the incandescent mantle industry, written by C. R. Böhm, who describes the rise and development of this important branch of manufacture, and gives a brief outline of the processes involved in the production of Welsbach mantles on a commercial scale.

The report on pharmaceutical chemistry is noteworthy because it includes a description of the synthesis of racemic suprarenine by Stolz and Flächer. The latter chemist has since separated this product into its two optical antipodes. The lævorotatory base is identical with the active base of the suprarenal capsules, and, when introduced into animals by intravenous injection, produces a very marked increase in the blood pressure. The dextrorotatory suprarenine, under similar conditions, is practically inoperative.

In addition to the above mentioned monographs, the volume contains reports on the recent development of chemical science under the various headings of physical, inorganic, organic, analytical, physiological, and agricultural chemistry. These summaries contain the same information, and discuss topics similar to those dealt with in the annual reports on the progress of chemistry published in recent years by the Chemical Society, and are therefore hardly likely to be preferred by the English reader.

OUR BOOK SHELF.

Radium. By J. P. Lord. Third edition. Pp. x+103. (London: Harding, Bros. and Co., 1910.) Price 2*s.* 6*d.* net.

THIS book, to quote from the preface, consists "of a careful compilation of the more material facts needed for an elementary understanding of radio-active phenomena, especially in relation to therapeutic and kindred progress," and the author's aim has been "to steer a middle course between the popular and the scientific literature of the subject, avoiding over-technicality, on the one hand, and on the other, that looseness of which the popular treatment of a scientific matter is peculiarly susceptible." On the whole the book seems fairly well fitted to fulfil its object. The author has successfully avoided over-technicality, but has not been entirely successful in retaining accuracy. In discussing the energy of radium, the view appears to be taken that because the radiations escaping are limited to a thin layer beneath the surface, the heat generated is also limited by the thickness of the layer. The commercially important ratio of radium to uranium in minerals is given as 700 milligrams of the former per ton of the latter, which is more than twice as great as the actual ratio. The present commercial price of radium is given as slightly more than 1000*l.* per grain, which is particularly unfortunate in such a book, since small quantities can be bought at the present time at about one-quarter or one-fifth this rate.

The chief interest of the book is the description and photographs given of certain new mines of autunite (hydrated uranium calcium phosphate) near Guarda, in Portugal, in the exploitation of which the publishers of the book apparently are interested. The deposits are described as occurring in lodes, varying from an inch to three or four feet in thickness, containing the uranium ore in crystals. A set of radiographs taken with the new material, of percentage of uranoso-uranic oxide varying from 39 to 1·5, is included, together with some plates of instruments commonly employed in the measurement of radio-activity. The last three chapters are devoted to the medical uses of radium, on the present state of which the author appears well informed.

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